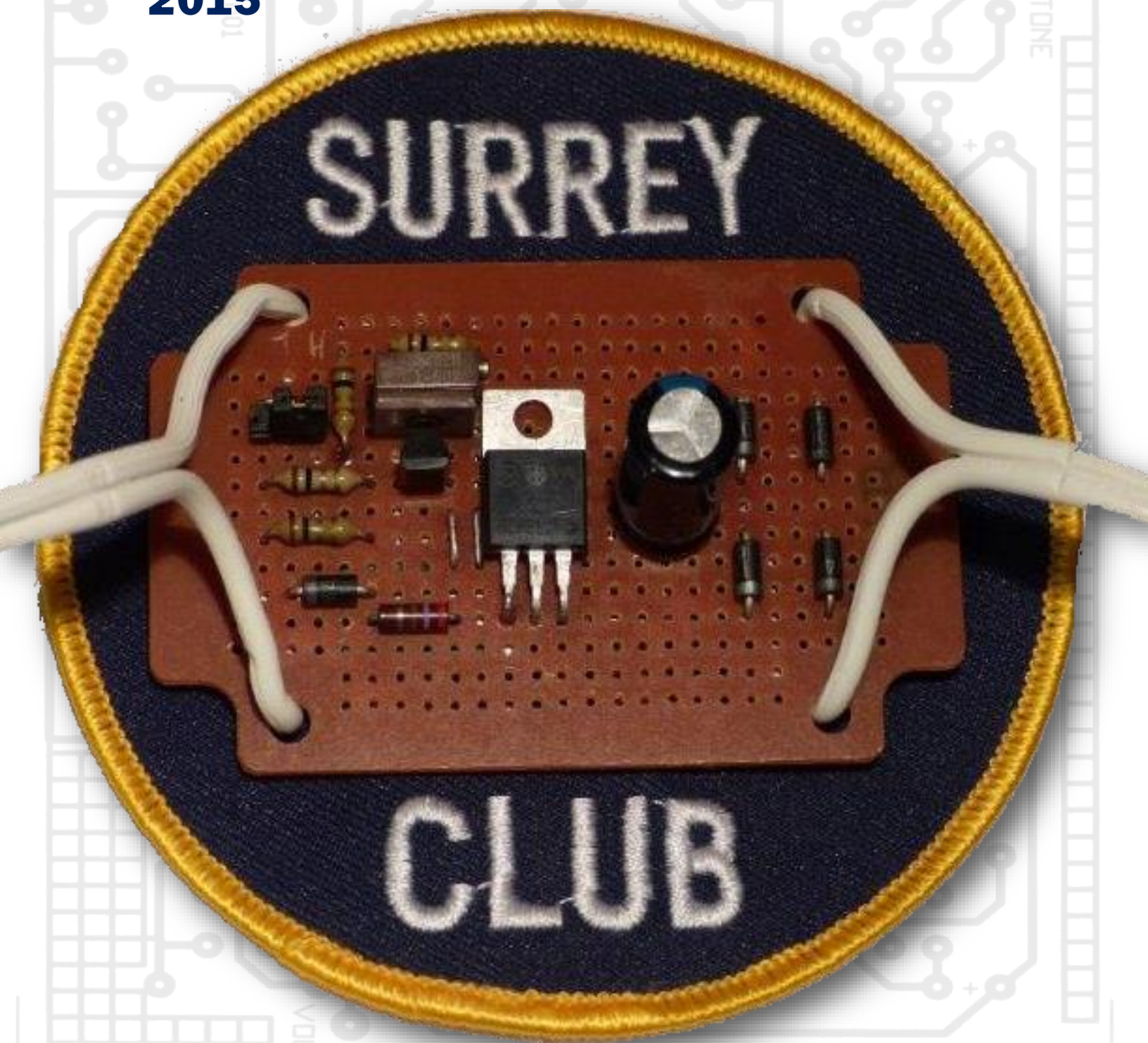




The Surrey Amateur Radio Club

Communicator



The Newsletter of the Surrey Amateur Radio Club

September 2015



At The Last Meeting...

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INSIDE THIS ISSUE

click on the page number below

Last Meeting	2
Contest Contender	7
Tech Topics: Gel Charger	8
Products & Gear	10
Back To Basics	11
QRM	12
News You Can Lose	13
A Bit Of Radio Lore	14
Emergency Comms	16
Satellite Specialty Group	18
Radio-Active	20

At The June Annual General Meeting...

Minutes of the June 10, 2015 Meeting

Introduction

The meeting was brought to order by President John Brodie VA7XB at 1900 hr. Visitor Guy Immega VA7GI from Vancouver was introduced by Jim Smith VE7FO and welcomed. Later visitor Nicholas Mufford VE7NEM from Langley was also welcomed.

The AGM agenda was reviewed and a motion accepted for approval; the motion carried. John asked for any corrections on the minutes of the 2014 AGM (which had been re-published in the June Communicator), and with no corrections being brought forth, called for a motion to approve last year's AGM minutes; the motion carried.

Annual Financial Report

The audited financial report, including the balance statement and income statement, was presented by Scott Hawrelak VE7HA. It was noted that the bank balance for the chequing and savings accounts exceeded last year's combined balance by \$1853. Not including equipment depreciation, income was reported as exceeding expenses by \$1821; both results were largely due to windfall income derived from the sale of donated equipment. Without this, income and expenses would have been approximately in balance.

A motion to approve the financial statement was made. Another motion that a gift certificate of \$75 be given to Paulette Schouten as thanks for her professional work in auditing the books was made. Both motions carried.

A revised membership fee schedule was introduced that provided for a 50% fee reduction applicable to long-term SARC members, i.e. those members who had a

continuous club membership of 25 years or more. A motion was made to approve the fee schedule; the motion carried. Keenan VE7XEN suggested that consideration be given to a fee reduction for members under financial hardship; it was agreed that this suggestion would be considered by the Executive, with a recommendation brought forth to the membership in the Fall.

Announcements

Al Peterson VA7ALZ reviewed the status of the raffle and Cruise-in. Noting that only 18 books of tickets (out of 125 books available) had been given out, he requested that all members take one or two books and sell them before the Sept 5th Cruise-in, with cash and stubs to be returned by the end of August. He also requested that volunteers commit to helping at SARC's booth. A sample hi-vis vest proposed for purchase by SARC members for use at the Foxhunt, Cruise-in, Field Day and other SARC events, was displayed by Al. A suggestion that the club purchase a number of vests and resell to members at cost, with or without a sew-on SARC badge, was favourably received by the members present, and will be pursued by the Executive over the summer.

John VA7XB announced that the 2m net would continue on an informal basis throughout the summer, with net control by whomever is available. Regarding the Friday breakfast meet, a decision will be made by the regular attendees whether or not to continue over the summer. A name



badge order will be placed by Scott VE7HA in September. Members were reminded that the after-meeting social at MacDonald's (Fraser Hwy at 156th St) would continue after the AGM, and consideration will be given later to changing the future location of the social.

John VA7XB suggested that get-togethers would be held on the normal meeting night in July and August at a different MacDonald's (72nd Ave near King George Blvd) for those interested.

The Fall/winter program was announced as follows:

September - task assignments and in-house swap meet (also project demos, as later determined)

October - John White VA7JW on baluns

November - George VE7QH on the BC Amateur Radio Coordination Council

December - Christmas party

There being no new business, the meeting broke for coffee, then resumed with Committee reports.

Committee Reports

Repeater Report:

The most significant change that we have seen in the status of the repeater system is its improved accommodation. Where we had our equipment exposed to heat and toxic air, we now have the equipment housed in its own room that is properly ventilated, pressurized and even air conditioned. The equipment is

now also separated from the boiler room preventing damage from human traffic and other activity in the boiler room.

There have been no new signs of corrosion. The equipment is performing well and we are pleased to report that we now have a secure and reliable venue for our reliable equipment.

As delegate to the British Columbia Amateur Radio Coordination Council (BCARCC), I attended the BCARCC annual general meeting. The Council is focusing on dealing with unused repeaters that are occupying coordinated frequencies while a large number of Hams have acquired new, digital repeaters and are looking for clear frequencies so that they too can put new repeaters on air.

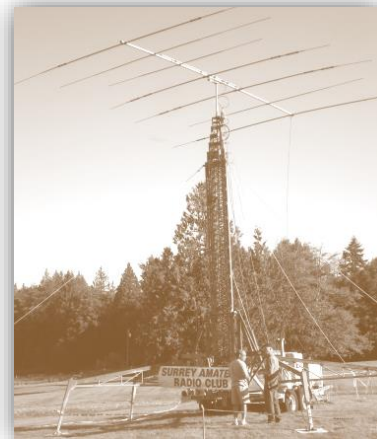
The SARC Contest Group

The SARC Contest Group was created this year (2014/2015) out of the SARC-SEPARS contest training program.

Our group of experienced contesters benefit from continual practice in serious contests while working from contest-grade stations (something most of us don't have). The group has fifteen members currently and the group overall has been very active over its first year. We officially participated in thirteen contests over the 2014/2015 season.

Special thanks are due to John VA7XB and Jim VE7FO, both of whom opened

(Continued on page 4)



The **SARC Communicator** is published monthly except July and August for members of the Surrey Amateur Radio Club.

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Non-members living in the Greater Vancouver area may receive one trial issue.

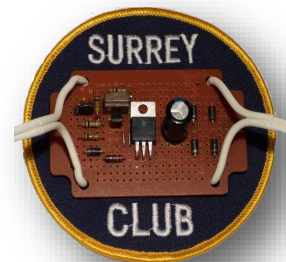
Beyond our membership area, annual Communicator subscriptions are available for a \$5 donation towards our Field Day fund.

SARC maintains a website at www.ve7sar.net that includes club history, meetings, news, photos and other information.

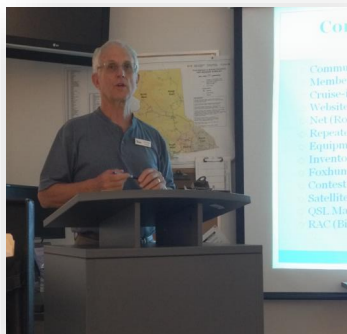
On The Cover...

Our cover photo this month features a project by Hui Yee VE7YXG, described in detail starting on page 8. Hui says there is a simple and effective way to maintain a gel cell battery properly, and that is by charging the battery under a constant voltage. If a fresh battery is not being charged from time to time, it will eventually die due to internal leakage.

Hui built the constant voltage charger that is shown to maintain his gel cell batteries and provides the circuit diagram and description so that you can too.



September 2015



"...the (satellite) group succeeded in making 7 contacts during the last two months"

(Continued from page 3)

up their stations to host members who don't otherwise have access to a contest-grade station. In addition, Jim has continued to provide advanced one-on-one contest training for members who wish to fully develop their contesting skills.

The contesting season is drawing to a close, but the Contest Group is bound to be active again starting next September.

~ Brett VE7GM

Satellite Group

The newly formed Satellite Group met 5 times since February, with one more meeting planned before Field Day. The group consists of 8 members: Sheldon VA7XNL, Jay VE7KC, Hiu VE7YXG, Ralph VA7UB, Nell VA7PE, John VE7TI and John VA7XB plus one non-SARC member Deme VE7CRT. After setting up and testing the satellite station, including CAT and rotor control, the group succeeded in making 7 contacts during the last two months, almost all through the Japanese satellite and linear transponder FO-29. A few members of the group are working on their own equipment setup with the idea of making contacts at home. With several new satellite launches planned this year, the group looks forward to more activity in the coming months.

'The Communicator'

As newsletter editor, it was another successful year. We published 11 issues, our regular 10 monthly editions plus the Summer Field Day wrap-up. Judging by feedback and our net stats it appears to be spreading around the globe, something we as a club should be pleased about and that I am personally proud of.

We had regular contributions from a number of our members and a few guest authors—my thanks for that. I encourage all of you to consider submitting news,

stories and information, no matter how short. This is YOUR newsletter and we can only be successful if we publish news of interest to club members.

As to promoting the club, remember that we also have a Twitter account, a FaceBook page, a YouTube channel and on-line photo albums. Please use them, the links are beside the QRT column near the end of this newsletter.

~ John VE7TI

The Website

The following are my observations with regard to the SARC website. First of all, the website is being maintained well and being kept up to date. There are no issues with regard to downtime, and access to necessary links is working well. Images of events as well as technical presentations that were posted so far have no access issues. However, I would like to solicit feedbacks, comments, or suggestions about our website or certain web pages that need improvement.

The current website was created using an older version of HTML with Java Script. Industry standards now in creating websites include Cascading Style Sheets or CSS, which is used for describing the look and feel or format of a webpage. With the use of CSS, the current website would even look better, creating visually engaging webpages, will have more flexibility with user interfaces for web applications, and user interfaces for many mobile applications. Another advantage using CSS is that aesthetic changes for multiple web pages can be done quickly and easily by just editing one CSS file.

Currently, I am learning to create CSS from online and other resources. I would like to thank Hiu also for giving me some video tutorials about HTML5 and CSS3. This would greatly help improve the SARC website moving forward.

~ Howard VA7HTZ

The SARC Net

Once again, the SARC Weekly 2-meter Net has run without any difficulties. I am still looking for additional people to act as Net Control Stations or alternates.

~ Rob VE7CZV

QSL Manager

SARC's former QSL manager, Nelson VE7NAE, has not been able to continue with the task and Heinz VA7AQ has volunteered to take on the job. During the couple of years since VE7SAR has become active in contests, approximately 50 QSL cards have been sent out in response to cards coming in by mail. In addition, contest logs have been submitted to LOTW for electronic confirmation of contacts. Brett VE7GM has volunteered to work with Heinz to get him up to speed on the LOTW procedures shortly, once the FD log is finalized.

Trailer Report

The two trailers were serviced in late May. All the pivot joints and pulleys were oiled or greased and the hydraulic oil reservoir level checked. The tires were all checked and holding pressure, and were all even. The generator starting battery electrolyte level was checked and no water was required. The battery passed the load test, with a 70% charge left. The battery tender maintainer charger was reconnected. The oil level in the generator engine was full and looks very clean. Propane tanks were filled last year and the supply should be sufficient for years. The generator was then started up and the tower was tilted up to test hydraulic cylinders. There is a log book on the trailer that records all that was done over the years. I would like to hand over maintenance over to a younger member as I have been doing this for 3 years now.

~ Rick VE7GMO

SARC Annual Foxhunt

The annual SARC Fox Hunt was held on May 23rd in Crescent Park in South Surrey. Twenty-two participants from Surrey, Delta and Burnaby Clubs supported the event. Five 2-watt VHF transmitters (foxes) were hidden throughout the park and participants were allowed two hours to find them. This year entrants were grouped into either novice or advanced classes. Though the event is focused on improving RDF skills, it's really about having fun and exchanging ideas about home brew directional antennas and attenuator kits. The second half of the event was the BBQ. We were blessed with dry weather for the event and members enjoyed camaraderie over a burger and hot dog. Thanks to Al Peterson VA7ALZ who, in spite of recent personal health problems, handled all the setup and the technical aspects of the foxes. Many thanks also to the volunteers, including Brenda, Anton's XYL, for their assistance at the BBQ.

The results - Advanced Class

1st place: Les Tocko VA7OM
2nd place: John MacConnachie VE7GED
3rd place: Joe Young VE7BFBK

Novice class

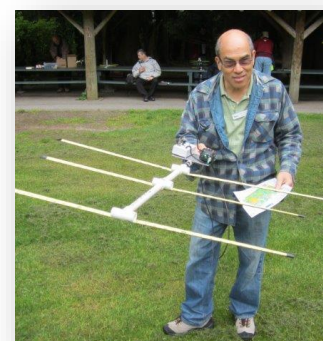
1st place: John Brodie VA7XB
2nd place: Kapila Jayaweera VA7KGK
3rd place: Sheldon Ward VA7XNL

At the concluding ceremony, the crystal fox trophy (along with bragging rights) was awarded to the winner Les VA7OM and the stuffed musical bunny was awarded to John Brodie VA7XB. Amel VA7KBA of BC Radio Sport offered to lead SARC in development of some 80m foxes and receivers for next year.

Members paid \$10 for the BBQ and, after expenses, a total of \$18.96 was raised for the club. Mark your calendars, approximately same time next year and we look forward to another successful event.

~ Anton James VE7SSD
Fox-Hunt Coordinator

"...approximately 50 QSL cards have been sent out in response to cards coming in by mail"



"We were blessed with dry weather for the (foxhunt) event and members enjoyed camaraderie over a burger and hot dog."

September 2015

"Rob Gilchrist VE7CZV was later thanked for his faithful service as Director and Secretary over the past 2 years."



Election of Directors

Bill Gipps VE7XS conducted the election of Directors.

John Schouten VE7TI advised that 40 members had paid dues for the new fiscal year and therefore were eligible to vote in the election. It was confirmed that a quorum of more than 25% of the paid membership (*equivalent* to 10 members) was indeed present, therefore the election could proceed.

Bill VE7XS advised that the bylaws provide for a maximum of 8 Directors, each elected for a 2-year term staggered such that 4 are elected each year, with the Directors subsequently appointing by consensus a President, Vice President, Secretary and Treasurer. Bill noted that 5 Directors, being in the 2nd year of their term (5 Directors instead of 4, due to an anomaly last year), would continue in their duties; these Directors are: Stan Williams VA7NF, Al Peterson VA7ALZ, Bill Gipps VE7XS, Brett Garrett VE7GM and John Brodie VA7XB.

Therefore 3 Directors would be elected at this AGM, with nominations for the 3 available positions being: Rob Gilchrist VE7CZV, Scott Hawrelak VE7HA, Al Neufeld VE7CDC, Mike Plant VE7AT, and John Schouten VE7TI. Bill VE7XS asked 3 times for further nominations from the floor and, with none received, closed the nominations and asked for each of the 5 candidates to say a few words about why they wished to be a Director. That having been accomplished, Bill requested that the past President, John VA7XB, outline options available. A variety of opinions was expressed by the members, concluding with a motion made, seconded and approved that the vote proceed. A vote by secret ballot followed, scrutinized by Bill Gipps VE7XS and two members, and the results subsequently announced as follows:

Directors elected were: John Schouten VE7TI, Mike Plant VE7AT, and Scott Hawrelak VE7HA.

Rob Gilchrist VE7CZV was later thanked for his faithful service as Director and Secretary over the past 2 years.

Field Day Planning

Stan VA7NF reviewed plans for Field Day with the following reminders:

Today

- Take and distribute FD poster

Friday June 26th

- Pre-event breakfast Kalmar 7:30 am
- Site setup commences at 10 am
- Monitor SARC repeater 147.360 (tone 110.9)
- You must sign PEP signup sheet
- Bring your own lunch
- Bring your own lawn chair
- Coffee & drinks available
- Pizza will be provided for setup crew at 6 pm

Saturday June 27th

- FD officially begins 11 am
- Bring family members in afternoon
- BYO food

Sunday June 28th

- Take-down commences 11 am

Volunteers were confirmed for several outstanding tasks. Stan requested assistance for the trial set up of antennas on Saturday June 13th as well as the Field Day setup on Friday, June 26th. Dixie Mogg VA7DIX volunteered to coordinate a social program if she can get 3 or 4 helpers. Mike Plant VE7AT agreed to host the Public Information table with the help of Kjeld Frederiksen VE7GL, Fred Reichstein VE7MPI and Elizabeth Gilchrist VA7ELA.

Members were reminded to take and submit photos for the FD photo contest to SARCCommunicator@outlook.com. Three prizes have been donated and will be awarded for the winning entries.

With no time left for the demonstration of members' battery monitor construction projects, this item was deferred to the September meeting, and the meeting adjourned at 2130 hr.

~ John Brodie VA7XB



The Contest Contender

Contest Updates



*SARC scores another win... This time in last winter's BC QSO Party.
Congratulations to the operators*

SARC Contest Group Calendar

September 2015

All Asian DX (SSB)	September 5 & 6th
WAE DX (SSB)	September 12 & 13th
CQ WW DX (RTTY)	September 26 & 27th

For Sale...

Icom ID-51A, with the RT software, hand mike, cables and connectors \$490. Radio only \$399

Don Hamilton VA7GL va7gl@icloud.com

September 2015

Tech Topics

Hiu Yee VE7YXG

12 volt—7.3 Amp Gel Cel Battery Charger



Fig. 1

"The charger can be connected to the battery for a long period of time and will keep the battery fully charged all the time even there is internal leakage of the battery itself. "

Two of my hobbies are hiking and camping. Usually I take my QRP gear with me, including a low capacity 12V gel cell battery, which must be properly maintained or its life is short. Some time ago, I bought two gel cell batteries at the same time. I used one of them frequently, and put the other one aside as a backup. When the time came that I wanted to use the backup battery, I found it was no longer useful as the battery voltage had dropped to a few volts and couldn't be charged. A brand new battery went dead simply from disuse.

There is a simple and effective way to maintain the gel cell battery properly, and that is by charging the battery under a constant voltage. If a fresh battery is not being charged from time to time, it will eventually die due to the internal leakage. I use the constant voltage charger that is shown in Fig.1 to maintain my gel cell batteries.

The operating principle of this charger is quite simple. The heart of the charger is a 3-terminal LM317 adjustable regulator. The output voltage is set at 13.5V for a gel cell, but other batteries may require a slightly different voltage.

Diodes D1, D2, D3 and D4 form a full-wave bridge rectifier. The rectified current is smoothed by capacitor C1 and applied to the input of LM317. The output voltage of the LM317 is set by the resistor R1 and potentiometer Pot1. There is an internal voltage 1.25V between the output and adjust terminals of the regulator. As shown in the circuit, R1 is placed in between these terminals. Therefore, the current flow through R1 is $1.25 \text{ volts} / 270 \text{ ohms} = 0.00463 \text{ amp}$ or 4.63 mA. This current also flows through Pot1 and establishes a voltage drop across it. What voltage drop is needed? As mentioned above, the output voltage of the charger is set at 13.5 V, and we get this output voltage after diode D5. Since D5 has a voltage drop of 0.6 V in the forward direction, the output voltage of the

regulator must be $13.5\text{V} + 0.6\text{V} = 14.1\text{V}$. Hence the voltage drop across Pot1 should be $14.1\text{V} - 1.25\text{V} = 12.85\text{V}$. Because there is 4.63mA on Pot1, the resistance of the pot should be $12.85\text{V} / 4.63\text{mA} = 2775 \text{ ohms}$. Since there is no standard value resistor of 2775 ohms, instead a 5K potentiometer is used.

Transistor Q1, resistors R2 and R3 form a current limiter. To complete the circuit, the charging current must go through R2 and R3. When this happens, a voltage is developed between the emitter and base of Q1. If this voltage is higher than 0.6V, Q1 turns on and its collector draws down the voltage across Pot1. Hence the output voltage of the charger is reduced and so is the charging current. What should the charging current be to charge a low capacity 12V gel battery? As the rule of thumb, the charging current is one twentieth of the capacity of that battery. For example, if you have a 12V, 7.3A gel cell battery, $1/20$ of 7.3A is 365mA. When 365mA goes through R2 and R3, it establishes 0.73V to the base of Q1. This voltage turns on Q1, therefore the charging current is always limited to 365mA.

Measurement of the voltage between the test points T1 and T2 will tell you the charging current. If the reading is 0.27 V, the charging current is 270 mA; if 76 mV, the current is 76 mA, and so on; 1mV corresponds 1mA.

In the circuit, D5 serves two purposes: first, it prevents damage to the charger and the battery if the output polarity is incorrect; second, it prevents the battery discharging itself through the charger while there is low or no power to the charger.

Under normal operation, there is a 3V voltage drop between the input and output terminals of the LM317, as we have calculated, the output voltage of the LM317 is 14.1V, therefore, the input voltage to the LM317 should be $14.1\text{V} + 3\text{V} = 17.1\text{V}$ or higher.

If you use DC only to power the charger, you can omit D1, D2, D3, D4 and C1 to simplify the circuit. You can simplify the circuit even more by removing Q1, R2, and R3 if you don't need the current limiter. Fig.2 shows the much simplified circuit.

When a solar panel is used to power the charger, apply the output of the panel directly to the input of the LM317 rather than through the bridge rectifier, because the bridge rectifier will cause a 1.2V drop. Even a loss of 1.2V represents a significant power loss under a cloudy sky.

Since the bridge rectifier takes away 1.2V from the power source, then why use it? Well, the reason is that with it, either an AC or DC power source can be used. When only DC power is used, it helps to prevent incorrect polarity hook up. With the rectifier being used, the input voltage of the charger should be $17.1V + 1.2V = 18.3V$ or higher. 18V is acceptable.

After the charger is built, a simple adjustment is needed. Adjust Pot1 to the mid-range before power is applied to the charger, then use a voltmeter to monitor the output voltage. Adjust Pot1 until the voltmeter reads 13.5V. This is it, all done. Since this charger provides a low charging current, a heat-sink is not needed for the regulator LM317, but no harm in using one. Fig.3 and Fig.4 show the construction and physical size of this charger.

Because this is a constant voltage charger, there is no over-voltage to the battery to harm it. Also, because the charging current is limited to 365 mA, not much heat will be generated inside the battery. The charger can be connected to the battery for a long period of time and will keep the battery fully charged all the time even there is internal leakage of the battery itself. This charger may be suitable if you want to have emergency power handy to operate your QRP rigs. All the parts used to build this charger are from my junk box. Happy home brewing!

The author would like to thank John Brodie VA7XB for his input, editing and proof-reading of this article, thanks John!

- Hiu VE7YXG

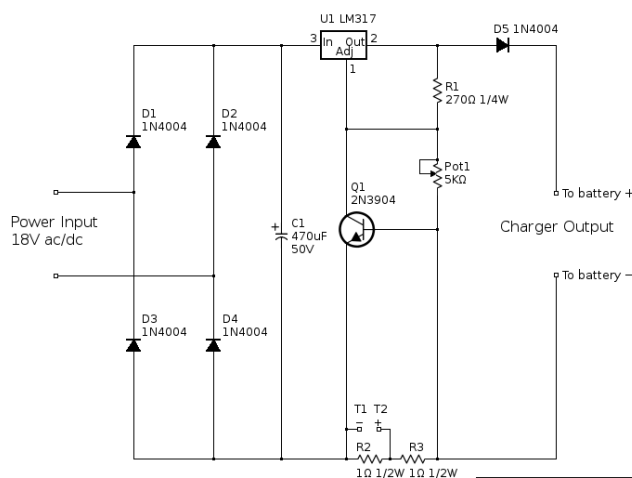


Fig. 1

Surrey Amateur Radio Club		
12V Gel Battery Charger		
Hiu Yee VE7YXG	Rev 1.0 2015-07-07	1 / 1

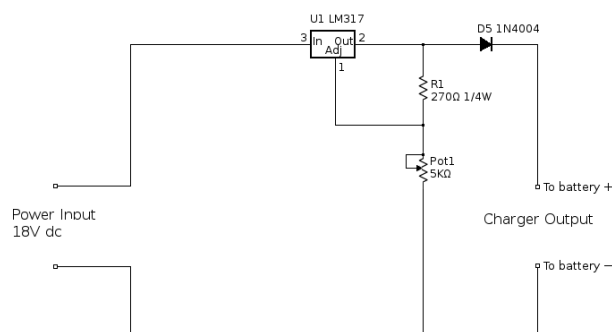


Fig. 2

Surrey Amateur Radio Club		
12V Gel Battery Charger		
Hiu Yee VE7YXG	Rev 1.0 2015-07-07	1 / 1



Fig. 2

September 2015



Products & Gear

Turn Your Smart Phone Into A Transceiver

"...turns your smartphone into a fully functional multi-band two-way radio."

Currently in testing by the FCC, the Alianza DxB is a portable rugged two-way radio docking case with an additional battery that turns your smartphone into a fully functional multi-band two-way radio. The DxB is able to communicate and work with all major two-way radio vendors.

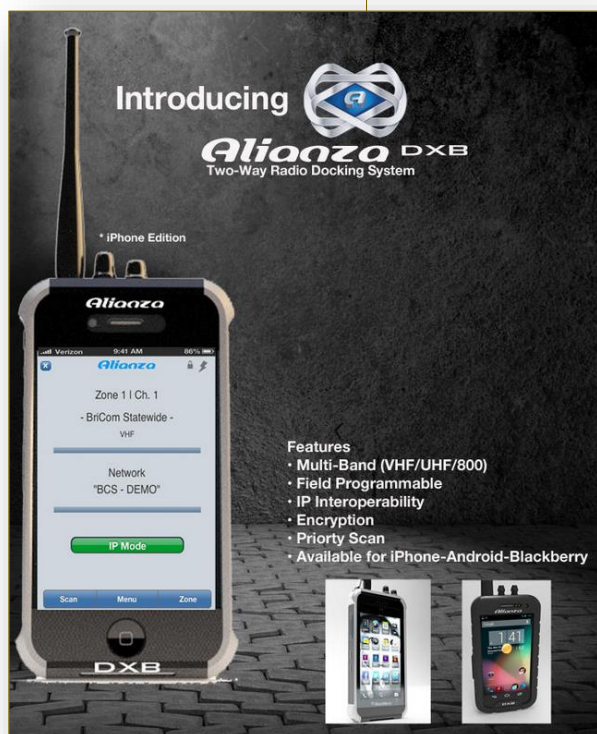
The Alianza DxB is a simple solution to today's communication needs by combining smartphone data with RF on a single device. This allows you to merge a smartphone and two-way radio into one device with the added benefit of a protective rugged case for your smartphone and eliminating the need for you to carry multiple devices. The multi-band feature enables the two-way radio to communicate across all frequency bands (VHF, UHF, 800Mhz) for seamless interoperability. It also uses your existing smartphones data to extend the communication distance from 25 miles to anywhere in the world using the Radio-over-IP repeater/gateway feature while

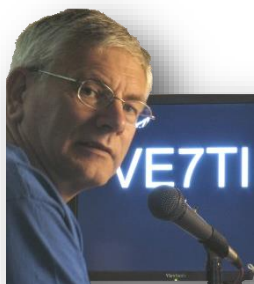
supporting all LTE networks. The case provides a waterproof, shock proof, and crush proof casing for your smartphone which will be available for iPhone, iPod Touch, Android, and Blackberry—price not yet announced.

The manufacturers have integrated RF bands with cellular voice and data to create a unified communication device. At the heart of the DXB is its patented components and software, which merges the DXB's analog RF bands with common smartphone voice and data.

Docking your smartphone to the Alianza DXB and installing the programming app on your smartphone allows you to control the RF Bands. Using the simple User Interface, users can input their operating band, frequency, and scanning options. Once your frequencies are inputted you are ready to start communicating. All voice communications is carried via the RF bands like a traditional walkie-talkie. The DXB software sits silently and doesn't interrupt your day-to-day smartphone operation. Open it only when you need to make changes or change operating modes. This feature is what makes the DXB unique. For example a hiker can communicate with fellow hikers via handie-talkie while snapping pictures all from the same device. A security guard can communicate to Headquarters via handie-talkie while using his phone to capture incident information.

The DXB has its own built-in speaker and mic separate from the docked smartphones. This allows for the best voice quality. DXB also has a removable rechargeable battery used to power the unit and provides additional recharge power to your smartphone. The DXB also runs in IP mode, which turns your smartphone into an IP "Push-to-Talk" a.k.a. RoIP device. Using your phones data service, you can communicate to other smartphones, straight from the DXB. This is where DXB takes this feature a step further towards a complete interoperable device. The DXB has an internal RoIP gateway, which can listen on both RF bands and your smartphone voice/data. Converting the IP packets to RF transmissions. Allowing your communications via your cellular 3G/4G IP voice to be retransmitted through the RF band. Enabling users on their walkie-talkie to be able to communicate to a user on their smartphone and vice versa. All controlled and routed by Alianza DXB and its components.





Back to Basics

John Schouten VE7TI

What is the difference between VFO and Memory Mode? ...and the Counterpoise

What is VFO Mode?

VFO stands for Variable Frequency Oscillator. The VFO is part of the tuning circuitry in your transceiver that maintains a specific frequency that you dial in or select from your keypad. For example, it may be the SARC repeater frequency 147.360. The VFO shows the selected frequency on the display. If you select another frequency, the VFO changes the internal oscillator to tune it in. This can involve a lot of button presses, so Memory Mode was developed.

What is Memory Mode?

Most newer transceivers have memory channels that may be programmed for a specific frequency. You select the desired frequency in VFO mode and then assign and save it to a specific memory channel for quick and easy recall later. Memory channels can also remember the repeater offset, tones and other information that would take numerous button presses to recall each time if you were only operating in VFO mode. When the memory channel is selected, the memorized frequency and operating mode appear.

VFO

147.360

A Counterpoise For Your Hand-held

The counterpoise (sometimes referred to as a 'Tiger-Tail') is typically used in antenna systems for radio transmitters where a good earth ground connection cannot be constructed. In this application, it is simply a 19-inch length of common wire attached to the ground of your hand-held transceiver antenna terminal.

In the photo it is attached to a ring terminal with sufficient diameter to fit under the antenna. Alternatively, it can also be stripped of insulation and simply be wrapped around the antenna base, as long as it makes a good electrical contact.

It is very effective in extending the range of a portable transceiver in that it provides the 'missing' half of the dipole antenna for 2m or 70cm operation. In order to keep antennas short and manageable, radio manufacturers coil the antenna wire into a rubber covered spring—half the antenna. The transceiver body is the other half, but is not very effective from an RF perspective. Those little rubber antennas can have a very high SWR, power reflected back to your radio rather than radiating out. The counterpoise, left hanging down beside the radio on receive and transmit provides a much more efficient solution.

Try it with a weak station, you'll notice the difference.

~ John VE7TI



The Counterpoise



More Information...

Do you fully understand SWR? How about Smith Charts? Here is an excellent article, downloadable as a pdf, that will enlighten on both subjects:

<http://www.arl.org/files/file/Technology/tis/info/pdf/q1106037.pdf>

September 2015



QRM

...from the Editor's shack

*Do you have a photo or bit of club news to share?
An Interesting link?*

*Something to sell or something you are looking for?
eMail it to SARCcommunicator@outlook.com for inclusion in this column.*

Welcome



SARC Examiner John Brodie (left) welcomes new SARC member Konstantin Kropivny who scored 100% on the Basic exam, and wrote the Advance exam immediately afterwards scoring 98%.

Konstantin will be known as VA7FFT.



Recent Vancouver Island transplant and SARC member John MacFarlane VE7AXU and John Brodie VA7XB renewing old acquaintances at the Black Goose Pub in Parksville.

An Ohm's Law Refresher

Test your technical skills with this Ohm's Law Refresher

If a 6 volt RV battery is available and the resistance of Johnny's stainless

steel engineering ring is 0.8 ohms:

1. what words does Johnny say when he gets the ring between the hot battery terminal, the wrench and ground?
2. how much current will flow through Johnny's ring?
3. How much power does this represent?
4. How much energy is consumed during the 1 excruciating second that Johnny maintains contact?
5. How will Johnny remove the ring from his burned and swollen finger?
6. Will Johnny have to buy a new ring?
7. Will Johnny be more careful next time?



Answers:

1. This is a family newsletter, but guesses are allowed.
2. $I = E/R$ so the current is $6 / 0.8 = 7.5$ amp
3. $W = I^2R$ so the power is $7.5 \times 7.5 \times 0.8 = 45$ watts
4. Energy = power x time so the energy is $45 \times 1 = 45$ watt seconds
5. Johnny will have to use his Dremel grinding disc to saw off his ring
6. It appears to be so
7. Definitely!

~ John 'Ringo' Brodie VA7XB

Wanted

John VE7TI needs five SO-239 feed-through connectors, at least 2-inches long.
VE7TI@outlook.com





Page 13—News You Can Lose

The Lighter Side of Amateur Radio

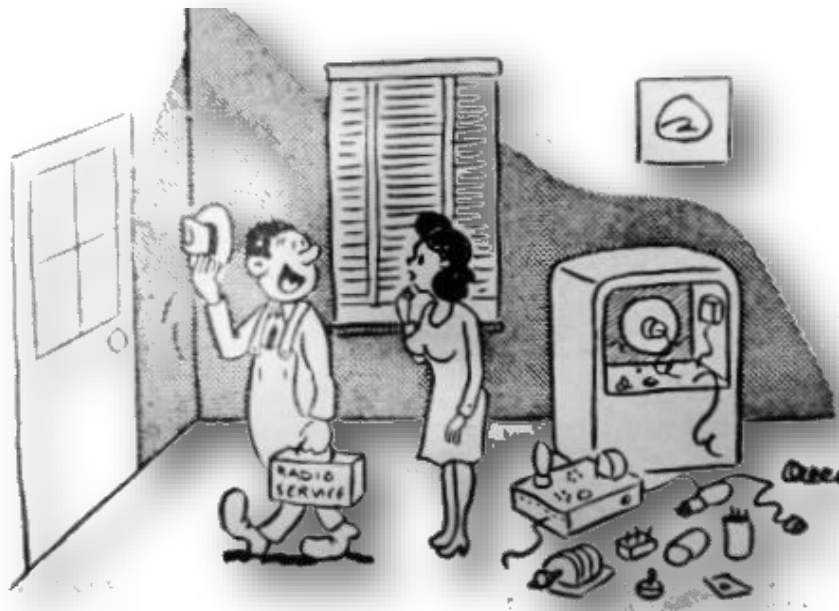
A Poor Man's Air Conditioner

As a result of our hot, dry summer, Anton VE7SSD came to Field Day with his own cooling system!

The components:

- A discarded cooler found on roadside
- two computer CPU cooling fans from discarded computers
- two ABS plumbing elbows - \$3
- a used dental floss container as an electrical junction box
- SPDT switch for selective fan switching, fast and slow \$3.50
- a few dabs of solder
- eight sheet metal screws
- a few blocks of ice, access to some 12V DC power

And presto... you have an air conditioner unit dependent on ambient temperature and fan speed, fully loaded with ice (sprinkled with some salt), expected to last 6 to 8 hours. Want to build your own? <https://www.youtube.com/watch?v=ITtlxjvLQis>



"That's as far as I know. I'll be back when I get my next lesson through the mail!"

September 2015

A Bit Of Radio Lore

Esther Inglis-Arkell

A Magician Used The First Pirate Radio Station To Troll A Scientist

"The pirate signal stopped just before the end of the lecture, and the real message came in."



John Ambrose Fleming
(1919)

Everyone knows Marconi was one of the world's most disagreeable scientists. What they don't know is he was surrounded by people nearly as disagreeable as himself. And that a famous demonstration of his "wireless" was taken over by a magician-turned-skeptic-turned-pirate.

In the early days, radio was treated with open skepticism by many. Oh, everyone agreed that radio waves could be sent through the air, but few agreed on the details. Guglielmo Marconi, who had worked out the first practical radio transmitter, made a not-so-very-good name for himself ruthlessly transforming his radio from a novelty into something that could send messages from across oceans.

In doing this, Marconi made a lot of enemies, although some of those enemies he did not deserve. As soon as he had demonstrated how revolutionary a business radio could be, other businesses sprang up, often run by people claiming that they had more of a right to the technology than Marconi did. One of the people who went into the radio business was Nevil Maskelyne, who also happened to be a magician.

Maskelyne was also a scientist, and inventor, and a skeptic. He was one of that class of magicians who loves magic when it is obviously fake, and hates it when it purports to be real. He debunked spiritualists and lampooned flim-flam artists, and he had decided that Marconi was just such an artist. Part of this was the fact that Marconi refused to conduct open and public tests of his technology. Given his competition, he can hardly be blamed for that. But Marconi deserved some of the skeptics' scorn.

He covered up failures and even made false claims. He claimed, for example, that "wireless signals" could not be interfered with. The messages encoded in a wireless signal came through to their receiver confidential and complete. To back that claim up, he hired revered scientist and engineer John Ambrose Fleming.

One night, Fleming gave a lecture at the Royal Society, during which he would receive a message in Morse code on his wireless set. The message was to come from a remote island, just at the end of a lecture on radio technology. Fleming got up and gave the lecture, calm and confident. The technician behind him saw the radio spring to life. It typed out, in code, a number of limericks about a "young fellow from Italy." Then it started in with some Shakespeare. As the lecture went on, the crew behind Fleming received more and more insulting messages. Someone had hijacked the radio. The technician, trying to be subtle, scanned the crowd and saw a confederate of Maskelyne, but there was no way to stop him without disrupting the lecture.

The pirate signal stopped just before the end of the lecture, and the real message came in. Fleming, hearing about the incident later, felt hugely insulted, and sent out an open letter condemning the "hooliganism." At that point Maskelyne gleefully pointed out that, if what Fleming had claimed about radio's confidentiality was true, there would have been no way to interfere with the radio signal. Fleming had disproved his own claims.

~ io9.com



This is one of the easiest, safest, and least abrasive ways to remove surface rust from iron and steel. It works well on rusted mast parts.

Supplies:

- Citric Acid Powder (available at drug stores or grocery stores as a health food supplement or a baking ingredient)
- Warm Water
- Container
- Scouring Pad / Brass Brush
- Rusty Parts

Safety:

Rubber gloves are a good idea

Don't splash it in your eyes

Precautions:

Do a test before trying this on something important - I've noticed it caused a swan chisel to turn very slightly yellow.

Do not try this on something like a saw blade with an etching you want to preserve - it might disappear.

Other Ways to Remove Rust:

Wire Wheel on a Grinder - this is probably the quickest way to remove rust, but it's still abrasive, so be careful around logos you want to keep.

Electrolysis - works well, but you have to be careful with batteries and water. not for the novice.

Sandblasting - very quick, but can leave a rough finish depending on the media. requires masking on painted parts.

Sanding - tedious and dirty and removes metal, but it works. sanding in very tight places can be impossible.

Advantages to using Citric Acid:

- Does not remove painted finishes.
- Less messy.
- Requires nothing you don't already have in the kitchen.
- Can be poured down the sink (citric acid is the main ingredient of some biodegradable cleaners).
- Way cheaper than sandpaper.

Step 1: Clean the parts

The rust on this wood plane wasn't too bad. The chip breaker was the worst part, but it was mostly just thick surface rust.

The first step is to clean off any dirt with water and a sponge.



Step 2: Prepare the solution

Find a container that is large enough for the parts to lay down flat. This way you only need to cover them with a shallow pool of water.

Place the parts in the container and cover them with warm water.

Add the citric acid powder and stir it in. Experiment with the proportions here. I used probably a 1/2 ounce of citric acid with 15 ounces of water.

September 2015



Emergency Comms

Stories of Ham Radio Making A Difference

Community Emergency Response Teams (CERT) are a component of Neighbourhood Emergency Preparedness Programs (NEPP), preparing your neighbourhood for emergencies using the skills of the local team members.

More information at URL:

http://deltapolice.ca/documents/emergprep/120216_nep_p_presentation.pdf

Editorial: The Critical Need for Amateur Radio Embedded in CERTs

This issue of the ARES E-Letter has focused on the Citizen Corps/CERT program for good reason: we as radio amateurs are potentially critical links in the community and neighborhood disaster survival chain. During the immediate aftermath of a disaster, "first" responders will likely be overwhelmed and not available to assist you, your family and neighbors. Your neighborhood could be isolated for a period of time. You will be first responder, relying on your own interventions for survival, mitigation of, and adaptation to, disaster after-effects. The best approach to personal disaster management I've seen is the CERT program, and under its umbrella, the development of your own neighborhood emergency response team. It will require drafting of a neighborhood plan, and recruitment of members to be trained in basic emergency support functions such as First Aid, light search and rescue, fire management, and, of course, communications for intra-team coordination and with the outside world.

There are a number of radio communication services that are available to the average citizen (Family Radio Service, General Mobile Radio Service, and Multi-Use Radio Service are examples), but none come close to the breadth and depth of utility of the amateur service. Radio amateurs are found in almost every neighborhood across the country and

should be key members of a neighborhood team. Without communications there can be no coordination. Without coordination, there cannot be an effective response mounted to potentially save the lives and property of you, your family members and neighbors.

The ARRL recognizes this: In June 2003, ARRL became an official affiliate program of Citizen Corps, an initiative within the Department of Homeland Security to enhance public preparedness and safety. A Statement of Affiliation was signed and made ARRL an affiliate under the four charter Citizen Corps programs -- Neighborhood Watch, Volunteers in Police Service, Community Emergency Response Teams, and Medical Reserve Corps. The 2003 SoA demonstrates the ARRL's commitment to community emergency preparedness through the Citizens Corps programs.

Indications are for larger and stronger storms, more sea-level encroachment and severe flooding, wildfires, and droughts. Now is the time to start your own CERT program and neighborhood emergency response team and plan to involve your family members and neighbors to be ready for All Hazards, to meet them when you may be isolated and on your own for hours, or even days or weeks.

~ K1CE

D-STAR On A Budget

If you'd like to get started with digital ham radio, but the cost of a D-STAR or other digital rig has stopped you, take a look at <http://w5vwp.com/moteino.shtml> This web page describes how to start experimenting with inexpensive single chip low power 433mhz or 900Mhz FSK digital transceivers.

~ eHam:

Interested In A Course?

Upcoming EMBC Emergency Management Courses:

- SWE EM712 EOC Level 3 Operations, Coquitlam, Sept 11, 2015
- SWE EM132 Disaster Recovery Port Moody, Oct 5-6, 2015
- SWE EM730 Emergency Evacuation, North Shore Emergency Management, Oct 22nd
- SWE EM100 Radio Station Management, Delta, Nov 14, 2015
- SWE EM714 EOC Level 3 Logistics, Richmond, Nov 17, 2015

**For more information contact
EMBC at 604 586-4390**

New Technology for Emergency Communications?

It looks like an HF cellular system, but little detail has been provided so far. Rockwell Collins unveiled ARINC UrgentLink, the first national disaster communications network in the U.S.A. for public safety that enables first responders, public health, public safety and critical industry officials to communicate with each other when traditional networks are damaged or destroyed. ... Available as a subscription-based service, the ARINC UrgentLink network uses Federal Communications Commission (FCC) licensed radio frequencies specifically authorized for disasters and Rockwell Collins' proprietary High Frequency (HF) technology." For more details, click on http://www.rockwellcollins.com/Data/News/2015_Cal_Yr/IMS/FY15IMSNR34-UrgentLink.aspx

Want To Go To Mars?

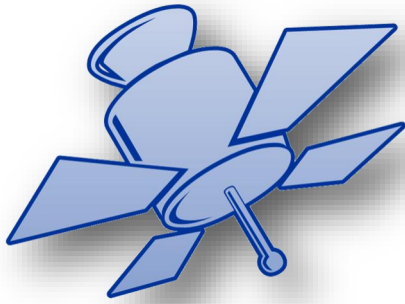
Well... almost. You can send your name to Mars on a computer chip installed on the next exploration mission dubbed 'InSight'.

Be quick though because registration closes on September 28th. More information at URL:

<http://mars.nasa.gov>



September 2015



Satellite Specialty Group

Hector Martinez W5CBF & CO6CBF

Extreme DX satellite contact between UK and Texas

We made a satellite QSO with Hector this past spring.

A video of John VA7XB making a satellite contact is available at:

<http://tinyurl.com/SARC-Sat-Contact>

On April 27 at 1901 GMT, Cuban radio amateur Hector Martinez W5CBF & CO6CBF achieved a 7537.8 km DX contact with UK amateur Peter Atkins G4DOL via FO-29, possibly a world record for the satellite.

I am pleased to report that Peter G4DOL and I had another extreme QSO on FO-29. It is my furthest contact on the birds!

Back on October 2013, Peter and I had a very nice contact between EL92sd, Cienfuegos, Cuba and IO80so, Weymouth area, UK. It was a 7286 km contact and probably the first contact between UK and Cuba on FO-29!

Peter and I desired to try again on FO-29, this time between EM21hs, Texas, US and his habitual spot in IO80so. We were able to complete a very nice CW contact on the 92319 orbit of FO-29. Peter had just 0.1

degree as maxim elevation while I had 0.8 during the 80 seconds mutual window. As before, Peter did all the hard work by driving until his habitual spot at a cliff-top and setting up his "portable satellite station" (19 elements Yagi for 435MHz and 10 elements Yagi for 145 MHz both with horizontal polarization). FO-29 was sounding really good on these orbits. It was a solid 559 satellite contact, we were very impressed

We made the calculations using our 10 digit grid squares at <http://no.nonsense.ee/qth/map.html> The distance between the stations was 7537.799 km (4683.77 mi). To my knowledge, the longest distance achieved on FO-29 until now had been 7,533.685 km between Frank, K4FEG and Erich, DK1TB <http://www.qrz.com/db/k4feg>

It appears that an even longer distance is achievable. It has been reported that FO-29 has a "theoretical maximum range" of 7502 km, but I guess that at least 7600km is doable. We will try to break our own record!

This contact was possible thanks to the great feature implemented on SatPC32 V12.8b. There is an option of seeing the frequency you are at the satellite receiver at any time during a pass. It allows the operators to tune the right frequencies and attempt a contact without having to search for each other.

Thanks very much to Peter for his persistence, effort and all the fun!

~ Hector, W5CBF/CO6CBF

2013 FO-29 satellite contact between Cuba and the UK

<http://amsat-uk.org/2013/10/20/fo-29-satellite-contact-between-cuba-and-the-uk/>



Miscellany

Collected Tidbits From Here and There

New Canadian Band Plan

RAC has published a new band plan. You can print your own copy by downloading a pdf version it at <http://rac.ca/rac-0-30-MHz-band-plan>



Rotary Bike-A-Thon

On Sunday, July 12th a number of local hams assisted with the Rotary Club of Vancouver Bike-A-Thon, an annual charity fund-raising event. The ride starts at Brentwood Shopping Centre in Burnaby and finished at the Harrison Hot Springs Hotel. This year marked the 31st annual event and 180 riders took part and biked 120km to raised a record breaking \$164,800 for BC Children's Hospital! It was a gorgeous day with slight overcast and mild temperatures. A well timed respite from the heat the prior week and the days following. The first riders completed the route in 3.5 hours, an amazing pace considering the hills along the way and the fact that roads were open to regular traffic.



Radio traffic was passed via simplex and the SARC repeater and consisted mostly of rider updates and mechanical breakdowns, which were amazingly few this year. Lunch is provided for riders and volunteers alike as is a nice dinner at the Harrison Hotel afterwards. Here are even some fabulous draw prizes to be won.

SARC member Ken Clarke VE7BC organizes the communications and looks for volunteers in May. They plan to do it again next year so mark your calendars now for July 10th, 2016 and assist for another spectacular day!



SARC Summer Get-Together

While there are no formal SARC meetings in July or August, we do try to get together. Of course the Friday breakfast is year-round but we meet on our 2nd regular Wednesday evening of July and August as well. July was particularly well attended with approximately a dozen members on hand.

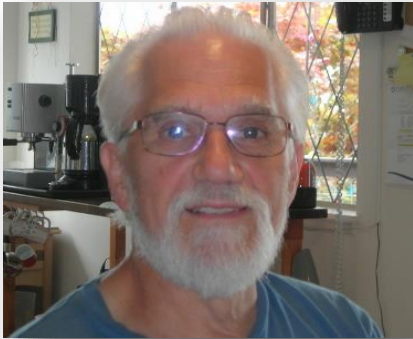


September 2015



Radio-Active

Jinty Reid VA7JMR



**Howard Brydle
VE7HKB**

Howard was born and 'bred' in Vancouver where he attended Lord Byng Secondary School. He describes himself as a 'bookworm' at school. While attending high school he also worked part-time at the Vancouver Public Library. After graduating from high school Howard went to UBC where he studied physics, eventually obtaining his Bachelor of Science. Following his love of travel he moved to Borneo in Malaysia in 1971 where he worked for C.U.S.O. a non-profit development organization whose goal is to work alongside local people in other countries and to improve the lives of people living with poverty and inequality. While living in Borneo, Howard taught local children mathematics. He also hunted lizards (known as "Flying Foxes") and turtles. Led by his adventurous spirit, he climbed Kinabalu Mountain, which is the highest

mountain in South East Asia. During his time in Malaysia he travelled to Indonesia, Thailand, and Bali. Moving on he went to Australia and New Zealand where he taught physics in a Catholic girls' school from 1974 to 1976. En route back to Vancouver, he detoured, spending time in India, Sri Lanka, Burma, Nepal, Afghanistan, Greece and London. Once back in Vancouver he returned to UBC to obtain his teaching degree. For a while he taught computer training in a Langley public school.

By this time Howard had moved to White Rock. During the summer holidays from teaching he ran a camp for kids, "Computer Racquet," in which he combined teaching computer skills and teaching racquetball. In 1983 he married Nancy and they set up home together in his White Rock townhouse. At this point he changed careers and began working for a computer company in retail and wholesale and acting as their technical advisor.

In 1985 Howard and Nancy's first child was born, a son whom they named Jesse. This was followed in 1987 by the birth of their second son Scott who is a Highland Games competitor. Their last child, a daughter named Ann, was born in 1989. Ann lives in Victoria and Scott and Jesse live in Vancouver.

Howard retired in 2013 and Nancy retired from her job at Ocean Park library after working there for 19 years. Looking around for new horizons, Howard became interested in volunteering in emergency services in the capacity of amateur radio. He studied for his Basic License on his own and took the exam and passed while attending Field Day in June 2015 with Mike Plant as his examiner. He has applied to join SEPAR and is a new member of SARC. He has a Kenwood Tri-Bander TH-F6 handheld radio and enjoys monitoring frequencies at present but plans on taking the plunge and participating in Tuesday night nets. Howard is feeling his way in the amateur

radio world as he explores other possible area of interest as a Ham.

Still bitten by the travel bug Howard hopes to spend some time with Nancy in Scotland and Scandinavia. They are presently planning a Mediterranean cruise. Looking for things to occupy their time in retirement both Nancy and Howard have taken up painting in acrylics, playing golf and Howard is learning to play the mandolin and hopes to learn to play Blue Grass music. Oh and did I forget to mention that Howard has been a runner for some time having run 2 or 3 half marathons (20 km), and does 10 and 30 km. He has won several medals for his running. Check out the photo of him running as Santa!

Nancy states that Howard is easy going, shy at first but then friendly after a short time, has a good sense of humour, is patient and likes to keep busy. She finds him easy to live with. Well Howard, after that glowing report I am sure we are all looking forward to getting to know you and work with you in amateur radio. Welcome to SARC and the radio world.

- Jinty Reid VA7JMR



Howard & Nancy. A new Ham is born!



Vancouver Sun: Howard in the 2008 Sun Run.

September Events

Sun	Mon	Tue	Wed	Thu	Fri	Sat
30	31	1 1930 SEPAR Net 2000 SARC Net	2	3	4 0800 Club Breakfast: Kalmar Family Restaurant, King George Blvd & 81 st Ave	5 Contest: All Asian DX (SSB)
6 Contest: All Asian DX (SSB)	7	8 1930 SEPAR Net 2000 SARC Net	9 1900 SARC General Meeting	10	11 0800 Club Breakfast: Kalmar Family Restaurant, King George Blvd & 81 st Ave	12 Langley Good Times Cruise- In Contest: WAE DX (SSB)
13 Contest: WAE DX (SSB)	14	15 1930 SEPAR Net 2000 SARC Net	16	17	18 0800 Club Breakfast: Kalmar Family Restaurant, King George Blvd & 81 st Ave	19
20	21	23 1930 SEPAR Net 2000 SARC Net	23 SARC Exec Meeting	24	25 0800 Club Breakfast: Kalmar Family Restaurant, King George Blvd & 81 st Ave	26 Contest: CQ WW DX (RTTY)
27 Contest: CQ WW DX (RTTY)	28	29 1930 SEPAR Net 2000 SARC Net	30	1	2	3

September 2015

CLUB EXECUTIVE 2015-2016

PRESIDENT

Mike Plant VE7AT

VICE PRESIDENT

Brett Garrett VE7GM
(Memberships)

SECRETARY

John Brodie VA7XB

TREASURER

Scott Hawrelak VE7HA

DIRECTORS

John Schouten VE7TI
(Communicator Editor)Stan Williams VA7NF
(SEPAR Liaison)

Bill Gipps VE7XS

Al Peterson VA7ALZ

On the Web

ve7sar.net

Between newsletters, watch your e-mail for announcements of events, monthly meetings and training opportunities. These announcements can also be found on our web page, or via:

Twitter

[@ve7sar](https://twitter.com/ve7sar)

FaceBook

[SurreyAmateurRadio](https://www.facebook.com/SurreyAmateurRadio)

Our YouTube Channel

[SurreyARC](https://www.youtube.com/SurreyARC)

SARC Photo Albums

Web Albums

or

tinyurl.com/SARCphoto

QRT

Mike Plant VE7AT—SARC President

On Your Marks, Get Set, Go...

Are you ready for an interesting and fun year ahead?. The 2015 - 2016 fiscal year is upon us,

As your new president, I have several interesting projects in mind that will challenge us as a club and as individuals. These projects need to be taken to our Executive to be discussed, developed and put into action. As we have done in the past the Executive will support anyone that undertakes a club project or event that benefits our membership and moves our club forward.

I can't wait to "get stuck in" and build on the hard work and excellent leadership John VA7XB has given us over the last 6 plus years.

Thank you John these are some pretty big boots for me to fill.

~ Mike VE7AT

Your 2015-2016 Club Directors were elected at the June Annual General Meeting. Scott Hawrelak VE7HA, Mike Plant VE7AT and John Schouten VE7TI were elected to two-year positions. The remaining Directors are entering the second year of their term.

In keeping with our constitution and by-laws, the Directors met and elected the Club Officers. Mike Plant will be the President for the coming year. John Brodie assumes the Secretary position and the remaining Directors retain their previous responsibilities. Brett Garrett VE7GM will assume maintenance of the club membership roster in addition to his Vice-President role.



Left to Right: Al Peterson, John Brodie, Stan Williams, Scott Hawrelak, Mike Plant, Brett Garrett and John Schouten.



It's September Already!!

Our first meeting of the 2015-2016 season will be on September 9th at 7pm at the Emergency Management BC PREOC, 14275 96th Avenue, Surrey.

The year ahead will be presented and the results of the Battery Monitor contest! Also we will once again have an on-site swap meet so clean out those drawers, basements and shacks and bring it down to the meeting.

Remember to support our fund-raising sale of raffle tickets for the Cruise-In and please volunteer for the event on Saturday, September 12th. More in the September Communicator.

The weekly club breakfast continues at the Kalmar Family Restaurant at King George Blvd & 81st Avenue, Surrey every Friday at 8am.

Down The Log...

SARC Monthly Meetings

2nd Wed. (Sept-Jun)
1900 hrs at the
Emergency Mgmt BC
PREOC,
14275 96th Avenue,
Surrey, BC

Weekly Club Breakfast

Friday at 0800 hrs
Kalmar Family
Restaurant at
King George & 81st
Surrey

SARC Net

Tuesday at 2000 hrs
local
on 147.360 MHz (+)
Tone=110.9

SEPARS Net

Tuesday at 19:30 hrs
local
on 147.360 MHz (+)
Tone=110.9

SEPARS Monthly Training

4th Tuesday of each
month, 1900-2100 hrs
14923—64th Ave, next
to Firehall #9, Surrey.

SARC hosts an Amateur Radio net each Tuesday evening at 8 PM. Please tune in to the VE7RSC repeater at 147.360 MHz (+600 KHz) Tone=110.9, also accessible on IRLP node 1736 and Echolink node 496228. On UHF we operate a repeater on 443.775MHz (+5Mhz) Tone=110.9 and Echo-Link Node 1736

	SEPARS Net	SARC Net
1 st Tuesday	Drew VA7DRW Jay VE7KC Stdbby	Drew VA7DRW Brett VE7GM Stdbby
2 nd Tuesday	Dixie VA7DIX Alan VA7BIT Stdbby	Jinty VA7JMR
3 rd Tuesday	Rob VE7CZV	Rob VE7CZV
4 th Tuesday	Jinty VA7JMR Dixie VA7DIX Standby	John VA7XB
5 th Tuesday	Jinty VA7JMR	Elizabeth VE7ELA
Want a turn at Net Control? Contact the SARC Net Manager VE7CZV @ separs.net		



We Have A SARC Patch!

These are suitable for sewing on a jacket, cap or your jammies, so you can proudly display your support for the club.

The price is \$4 each or three for \$10 and they can be picked up at the meeting or a Friday morning breakfast.

Burnaby Radio Communications

Michael J. Wong VE7HMW
President/Owner

4257 Hastings Street
Burnaby, B.C. V5C 2J5
Phone 604-298-5444
Fax 604-298-5455

Commercial / Amateur Radio
Email: sales@burnabyradio.com
web: www.burnabyradio.com

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Latest Model Available!

QUAD BANDS TRANSMISSION (including SW)
EIGHT BANDS RECEPTION (including AM & SW)

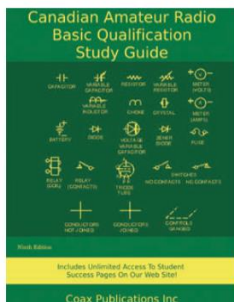
Twin Band/Same Band Simultaneous Reception;
Duplex Mode (Cross-Band Simultaneous TX&RX) Duplex Cross-Band Repeat;
Same-Band Repeat on two Combined Radios; 8 groups of Scrambler SOS Function

KG-UV950P



NEW FROM COAX PUBLICATIONS INC FOR 2015!

9TH EDITION: THE CANADIAN AMATEUR RADIO BASIC QUALIFICATION STUDY GUIDE



- ✓ Completely revised to address changes in technology in the five years since the 8th edition was produced
- ✓ Matched to the Industry Canada Question Bank update in 2014 with more context for the new and revised questions
- ✓ Still includes unlimited access to our acclaimed online Student Success Pages support
- ✓ New Ask The Professor help added for some questions

Same Low Price! Just \$44.95 plus shipping and taxes.

Note for 8th Edition owners: We are still supporting your book. The section references for the Industry Canada questions have changed in the new edition and we have changed our website to ensure that when a reference to a section is presented it will be correct for both editions. The selection is made automatically for you when you log on.

Order both Study Guides from our Secure Web Site: <http://www.coaxpublications.ca>
or e-mail: coaxpublications@iilife.ca

ALSO AVAILABLE FROM COAX PUBLICATIONS INC!

THE CANADIAN AMATEUR RADIO ADVANCED QUALIFICATION STUDY GUIDE

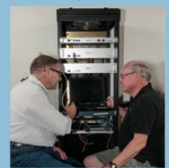
This 340-page book follows the same format and teaching methods as our extremely successful Basic Qualification Study Guide.

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